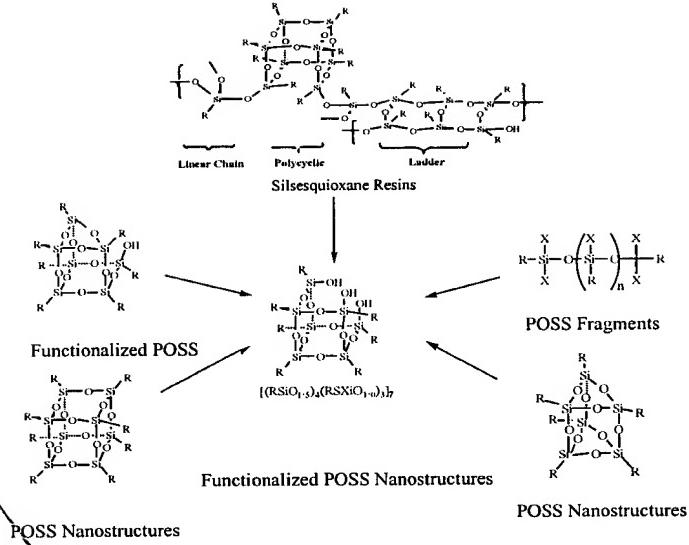
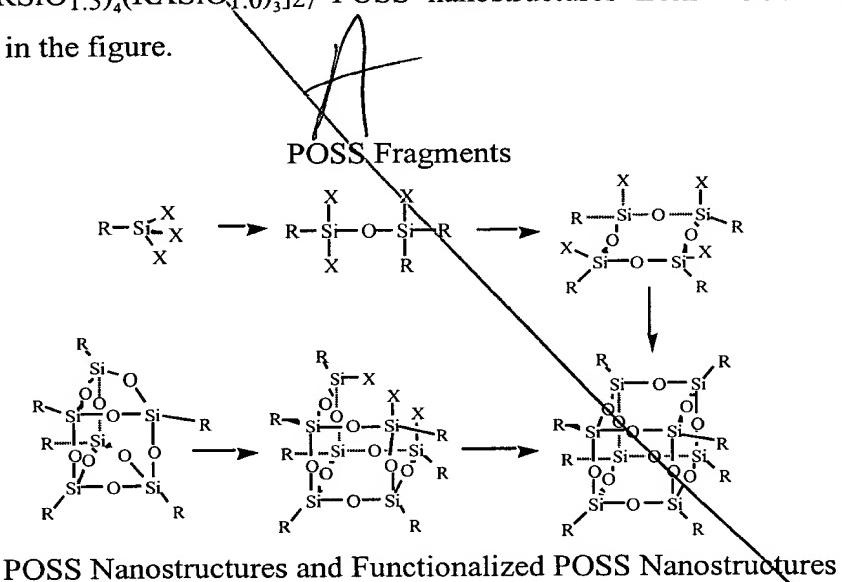


CLAIMS

1. The process of using bases to convert polysilsesquioxane resins into POSS nanostructures of the type: homoleptic  $[(RSiO_{1.5})_n]_{\Sigma \#}$ , heteroleptic  $[(RSiO_{1.5})_m(RSiO_{1.5})_n]_{\Sigma \#}$  and functionalized heteroleptic  $[(RSiO_{1.5})_m(RXSiO_{1.0})_n]_{\Sigma \#}$ . Where m and n represent the stoichiometric composition and # = the number of silicon atoms contained within the nanostructure (aka cage size).
1. 2. The process of using bases to convert POSS fragments  $[(RSiO_{1.5})_m(RXSiO_{1.0})_n]_{\Sigma \#}$  into POSS nanostructures of the type homoleptic  $[(RSiO_{1.5})_n]_{\Sigma \#}$ , heteroleptic  $[(RSiO_{1.5})_m(RSiO_{1.5})_n]_{\Sigma \#}$  and functionalized heteroleptic  $[(RSiO_{1.5})_m(RXSiO_{1.0})_n]_{\Sigma \#}$ .
1. 3. The process of using bases to convert POSS nanostructures homoleptic  $[(RSiO_{1.5})_n]_{\Sigma \#}$ , heteroleptic  $[(RSiO_{1.5})_m(RSiO_{1.5})_n]_{\Sigma \#}$  into functionalized heteroleptic  $[(RSiO_{1.5})_m(RXSiO_{1.0})_n]_{\Sigma \#}$  POSS nanostructures.
1. 4. The process of reacting POSS fragments with POSS and silicate nanostructures to form functionalized heteroleptic  $[(RSiO_{1.5})_m(RXSiO_{1.0})_n]_{\Sigma \#}$ ,  $[(XSiO_{1.5})_m(RXSiO_{1.0})_n]_{\Sigma \#}$  POSS nanostructures.
1. 5. The process of directly manufacturing  $[(RSiO_{1.5})_4(RXSiO_{1.0})_3]_{\Sigma 7}$  from polysilsesquioxanes  $[(RSiO_{1.5})_n]_{\Sigma \#}$ , nonfunctionalized  $[(RSiO_{1.5})_m(RSiO_{1.5})_n]_{\Sigma \#}$  POSS cages, and POSS fragments  $[(RSiO_{1.5})_m(RXSiO_{1.0})_n]_{\Sigma \#}$  using base as shown in the figure.



- 1 6. The process for the sequential growth of POSS fragments, homoleptic  $[(RSiO_{1.5})_n]_{\Sigma n}$ ,  
2 heteroleptic  $[(RSiO_{1.5})_4(RSiO_{1.0})_3]_{\Sigma 7}$  POSS nanostructures from POSS fragments using  
3 base, as shown in the figure.



- 1 7. The compositions reported in the examples for homoleptic  $[(RSiO_{1.5})_n]_{\Sigma n}$ , heteroleptic  
2  $[(RSiO_{1.5})_m(RSiO_{1.5})_n]_{\Sigma \#}$  and functionalized heteroleptic  $[(RSiO_{1.5})_m(RSiO_{1.0})_n]_{\Sigma \#}$  POSS and  
3 POSS silicate nanostructures.

*ADD  
A18*

*Add  
B287*